

# Claims

[c1] What is claimed is:

1. A method of MR spectroscopy (MRS) comprising the steps of:

acquiring a reference signal with a body coil;

acquiring metabolite signals with a plurality of receive coils;

combining the metabolite signals to form a single MRS spectrum; and

scaling the single MRS spectrum as a function of intensity of the reference signal.

[c2] 2. The method of claim 1 wherein the step of acquiring the reference signal includes the step of acquiring signal from unsuppressed water with a uniform  $B_1$  body coil.

[c3] 3. The method of claim 1 wherein the plurality of coils is a phased-array coil arrangement.

[c4] 4. The method of claim 1 further comprising the step of carrying out a pre-scan prior to acquisition of the reference signal.

[c5] 5. The method of claim 4 further comprising the step of determining at least one of shimming, transmit fre-

quency, receive coil gains, and transmitter gain from the pre-scan.

- [c6] 6.The method of claim 1 wherein the step of scaling includes determining a ratio of reference signal amplitude to single MRS spectrum amplitude and modifying the single MRS spectrum by the ratio.
- [c7] 7.The method of claim 1 further comprising using a phased-array volume coil arrangement for a spectroscopy examination in conjunction with an MR imaging examination.
- [c8] 8.An MRS apparatus comprising:  
a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MRS data, the RF coil assembly having phased array coils and a body coil; and  
a computer programmed to scale a composite signal of metabolite signals acquired with the phased array coils based on a reference signal acquired with the body coil.
- [c9] 9.The MRS apparatus of claim 8 wherein the computer is further programmed to determine an intensity of the ref-

erence signal and an intensity of the composite signal, and determine an intensity ratio therefrom.

[c10] 10. The MRS apparatus of claim 9 wherein the computer is further programmed to modify the composite signal by the intensity ratio.

[c11] 11. The MRS apparatus of claim 8 wherein the computer is further programmed to scale the composite signal such that signal intensity of water as determined from MRS data acquired by the whole body coil equals signal intensity of water as determined from MRS data acquired by the phased array coils and represented in the composite signal.

[c12] 12. The MRS apparatus of claim 8 wherein the computer is further programmed to combine metabolite signals respectively acquired from each coil of the phased array coils to form the composite signal and combine the metabolite signals in an SNR increasing manner.

[c13] 13. The MRS apparatus of claim 8 wherein the computer is further programmed to generate and display an MRS spectrum from the scaled composite signal.

[c14] 14. The MRS apparatus of claim 13 wherein the computer is further programmed to display the MRS spectrum for a single voxel of a VOI from which the metabolite signals

are acquired.

- [c15] 15. A computer readable storage medium having a computer program stored thereon to perform an MRS exam and representing a set of instructions that when executed by a computer causes the computer to:
- acquire unsuppressed MRS water signal with a transmit and receiver coil;
  - acquire MRS metabolite signals from a plurality of receive coils;
  - combine the MRS metabolite signals to form an MRS composite spectrum; and
  - scale the MRS composite spectrum to an intensity of the unsuppressed MRS water signal.
- [c16] 16. The computer readable storage medium of claim 15 wherein the computer is caused to scale the MRS composite signal such that the amplitude of the MRS water signal equals the amplitude of a water signal in the MRS composite spectrum.
- [c17] 17. The computer readable storage medium of claim 15 wherein the plurality of coils is a phased-array volume coil arrangement.
- [c18] 18. The computer readable storage medium of claim 15 wherein the computer is further caused to carry out a

pre-scan prior to acquisition of the reference signal.

[c19] 19. The computer readable storage medium of claim 15 wherein the computer is further caused to determine at least one of shimming, transmit frequency, receiver gain, and transmitter gain from the pre-scan.

[c20] 20. The computer readable storage medium of claim 15 wherein the computer is further caused to acquire data of a spectroscopy examination using a phased-array volume coil arrangement in conjunction with an MR imaging examination.